

REMARKS

By the above amendment, independent claim 1 has been amended to incorporate the features of dependent claim 2 therein with other features of claim 1 being clarified and dependent claim 2 being canceled. Additionally, independent claim 16 has been amended to incorporate the features of dependent claim 17 therein with claim 17 being canceled and claim 16 being amended to clarify features. As is apparent, since the claims have been amended to incorporate the features of dependent claims therein, no new issues requiring further search and/or consideration have been raised by such amendment. Additionally, the dependent claims have been amended, as appropriate, to depend from independent claims 1 and/or 16, rather than the dependent claims which have been canceled by the present amendment.

Applicants note that applicants consider that an interview may be helpful in resolving any outstanding issues, and applicants request the Examiner to contact the undersigned attorney to schedule an interview upon taking up this application for action, if considered necessary. Additionally, since this amendment is being submitted at the end of the second month extended period for response and since the office of the undersigned attorney has determined that the U.S. Patent and Trademark Office has delayed taking up amendments after final action for more than one month after the filing of such amendment, in order to avoid any question concerning applicants intention to abandon this application, submitted herewith is a Notice of Appeal.

Turning to the rejection of claims 1 and 16 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190); the rejection of claims 2, 13 and 17 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) and further in view of Melnick et al (6,348,959); the rejection of claims 3-6, 18-21, 30 and 31 under 35

U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) in view of Melnick et al (6,348,959) and further in view of Okada (6,542,211); the rejection of claims 7, 8, 22 and 23 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) in view of Melnick et al (6,348,959) in view of Okada (6,542,211) and further in view of Kitagishi Nozomi (JP 7-318861); the rejection of claims 9-12 and 24-27 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) in view of Melnick et al (6,348,959) and further in view of Okada (6,542,211) and further in view of Ichikawa et al (6,473,144); the rejection of claims 14, 15, 32 and 33 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) in view of Melnick et al (6,348,959) and further in view of Tanaka (5,895,108); the rejection of claims 28 and 29 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) in view of Melnick et al (6,348,959) in view of Okada (6,542,211) and further in view of Inoko (6,417,941); and the rejection of claims 34-37 under 35 U.S.C. §103(a) as being unpatentable over Kubo et al (US 2001/0024257) in view of Dir et al (4,767,190) and further in view of Miyake et al (5,729,306); such rejections are traversed insofar as they are applicable to the present claims, and reconsideration and withdrawal of the rejections are respectfully requested.

As to the requirements to support a rejection under 35 U.S.C. 103, reference is made to the decision of In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988), wherein the court pointed out that the PTO has the burden under §103 to establish a prima facie case of obviousness and can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a

legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Furthermore, such requirements have been clarified in the recent decision of In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002) wherein the court in reversing an obviousness rejection indicated that deficiencies of the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge".

The court pointed out:

The Examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is immaterial to patentability, and could not be resolved on subjected belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. (emphasis added)

As noted above, each of independent claims 1 and 16 have been amended to incorporate the features of dependent claims 2 and 17 therein, while being amended to recite the feature that an optical axis of an incident light beam upon the liquid crystal layer and an optical axis of an emergent light beam from the liquid crystal layer are present in a plane which is substantially perpendicular to a direction of orientation of liquid crystal molecules on the two substrates, the incident light beam

impinges upon the liquid crystal layer in a direction which is inclined by a predetermined angle to the direction of the normal line of the substrate, and a direction of polarization of the incident light beam upon the liquid crystal layer is substantially perpendicular or parallel to the direction of the orientation of the liquid crystal molecules. Irrespective of the Examiner's contentions, applicants submit that such features are not disclosed or taught in the cited art taken alone or in any combination thereof.

Looking to Fig. 1A of the drawings of this application, it is noted that a liquid crystal layer 111 having liquid crystal molecules 101 is disposed between an upper substrate 103 and a lower substrate 102 with the orientated state of the liquid crystal molecules 101 being substantially parallel to the substrates in the manner indicated. As shown in Fig. 1A of the drawings of this application and as described at page 11 of the specification of this application, the optical axis of an incident beam 105 and the optical axis of an emergent beam 106 is present in a plane which is orthogonal to the direction of orientation of the liquid crystal molecules. That is, the plane which is perpendicular to the orientation direction of the liquid crystal molecules in Fig. 1A lies in the plane of the sheet of Fig. 1A and both optical axes lie therein. Further, both optical axes make a predetermined angle θ (109) with respect to a direction normal (104) to the substrate 102 as shown in Fig. 1A. The polarized state of the incident beam is p-polarization or s-polarization with respect to the substrate 103, for example, so that the polarized state 107 p of the incident beam shown in Fig. 1A is p-polarization and is substantially perpendicular to the direction of the orientation of the liquid crystal molecules 101, noting that if the polarized state were s-polarization, the direction of polarization of the incident light beam upon the liquid crystal layer will be substantially parallel to the direction of the orientation of the liquid crystal molecules. With this configuration, the control of molecular orientation can be made with a low voltage and the time of liquid crystal response can be shortened so that

an advantage is obtained in that the voltage for driving the liquid crystal element can be remarkably lowered as described in the specification of this application.

Applicants submit that the recited features of independent claims 1 and 16 are not disclosed or taught in the cited art, as will become clear from the following discussion.

In rejecting claims 1 and 16, the Examiner refers to Fig. 57 of Kubo et al as apparently disclosing the claimed features, although the Examiner indicates "Kubo does not appear to explicitly specify an optical axis of an emergent light beam from the liquid crystal layer is in a plane which is substantially perpendicular to a direction of orientation of liquid crystal molecules on at least one of the two substrates." The Examiner, however, contends that Kubo et al discloses, in Fig. 57, the optical axis of an instant light beam upon a liquid crystal layer is present in a plane which is substantially perpendicular to the direction of the orientation of liquid crystal molecules, and the incident light beam impinges upon the liquid crystal layer in a direction inclined by an angle to the direction normal to the substrate. Irrespective of the contentions by the Examiner, applicants note that the published Kubo et al only extends to paragraph [0377] and does not provide any description of Fig. 57 other than in the Brief Description of the Drawings in paragraph [0112]. However, looking to Fig. 57 of Kubo et al, applicants submit that it is apparent that the direction of the orientation of the liquid crystal molecules 30a is present in the sheet surface of Fig. 57 or a plane thereof and extends in a direction from left to right or right to left in a direction corresponding to the extension direction of the substrate 101 as illustrated in Fig. 57. Applicants therefore submit that the plane perpendicular to the direction of orientation of the liquid crystal molecules is orthogonal or perpendicular to the extension direction of the substrate 101 and the sheet surface of Fig. 57, whereas the optical axis of the incident light beam as shown in Fig. 57 is necessarily present in the sheet surface of Fig. 57. With the construction as shown in Fig. 57 of Kubo et

al, assuming arguendo that the optical axis of the incident light beam as shown in the left hand portion of Fig. 57 of Kubo et al, may be considered to lie in a plane which is substantially perpendicular to the direction of orientation of the liquid crystal molecules on the two substrates which plane necessarily extends in a direction out of the sheet surface of Fig. 57 or perpendicular to the right-left extension direction of the substrate 101, it is apparent that the optical axis of the emergent light beam cannot and does not lie in the same plane, as recited in independent claims 1 and 16. Further, applicants submit that it is readily apparent that the incident light beam on the right hand portion of Fig. 57 does not have the optical axis present in a plane which is substantially perpendicular to a direction of orientation of the liquid crystal molecule 30a as shown in the right hand side of Fig. 57 and it is evident that it is not possible for the emergent light beam on the right hand side of Fig. 57 to lie in the same plane. Thus, applicants submit that contrary to the position set forth by the Examiner, Fig. 57 of Kubo et al fails to disclose or teach the claimed features of independent claims 1 and 16 in the sense of 35 U.S.C. 103 with respect to both optical axes do in a plane which is substantially perpendicularly to the direction of orientation of the liquid crystal molecule in the two substrates, and all claims patentably distinguish thereover. In this regard, it is readily apparent that there is no disclosure or teaching in Kubo et al, in addition to the optical axis of the incident light beam and the optical axis of the emergent light beam being present in the same plane, that the incident light beam impinges upon the liquid crystal layer in a direction which is inclined by a predetermined angle to the direction of the normal line of the substrate, and that a direction of polarization of the incident light beam upon the liquid crystal layer is substantially perpendicular or parallel to the direction of orientation of the liquid crystal molecules, as recited in independent claims 1 and 16.

The Examiner recognizing the deficiencies of Kubo et al as indicated in the Office Action, next refers to the patent to Dir et al contending that such patent

illustrates in Fig. 2, "incoming light vectors (23) and emerging light vectors (23) that appear to be oriented in a plane perpendicular to the direction of homogeneously aligned liquid crystal molecules (Dir, claim 2, lines 29-30). Dir claims (claim 2) that such arrangement reduces dry voltage (Dir, claim 2, line 37)." Irrespective of the position set forth by the Examiner, applicants note that Dir et al does not disclose a reflection substrate, as recited in claims 1 and 16, such that applicants submit that the Examiner by such combination has engaged in a hindsight reconstruction attempt utilizing the principle of "obvious to try" which is not the standard of 35 U.S.C. 103. See In re Fine, supra. The hindsight reconstruction attempt is also evident from the fact that Dir et al issued in 1988, almost two years prior to the Japanese filing date of Kubo et al, and about three years prior to the U.S. filing date thereof. Thus, it is readily apparent that Kubo et al did not adopt the disclosure of Dir et al therein, as now contended to be obvious by the Examiner, at least with respect to the failure of Dir et al to utilize a reflection substrate as one of the two substrates having a liquid crystal layer interposed therebetween.

Additionally, while the Examiner refers to incoming light vectors (23) and emerging light vectors (23), it is apparent from Fig. 2 of Dir et al, that the optical axis of the incident light beam is represented by the unnumbered direction with an arrow which extends from the light source 11, and numbered 10 in Fig. 1, for example.

This fact is evident from the disclosure of Dir et al at col. 8, lines 5-26, which provide:

In a second embodiment of the present invention, shown in Fig. 2, the weekly elliptically polarized light normally pass when the electrodes are all in the fully energized state can be extinguished with a conventional linear polarizing if a thin prismatic optical compensator 28 is used... This embodiment is schematically shown in Fig. 4... Light ray 33 is deflected through angle α as it passes through the slightly tilted, energized liquid crystal molecules 13. This angle α must be equal to the prism angle. The situation where the light travels along the original optical axis 10 may be obtained by simply tilting the image bar with the thin prism about the beam; that is,

by α degrees. In this manner, the polarized light travels through the liquid crystal material with an orientation that is substantially parallel with the liquid crystal molecules in their energized state. (emphasis added)

Thus, as is apparent from Fig. 4 which corresponds to Fig. 2 of Kubo et al, the optical axis 10 of the incident light beam, in view of the orientation of the liquid crystal molecules 13 and an optical axis of the emergent light beam, as represented by the light ray 33, are not present in a plane which is substantially perpendicular to the direction of orientation of the liquid crystal molecules, irrespective of the Examiner's contentions with regard thereto. Further, applicants submit that the Examiner has mischaracterized the disclosure of Dir et al, in that the vectors 23 and 24 do not represent the optical axis 10 of the incident light beam or emergent light beam as illustrated in such figures. Thus, Dir et al in addition to failing to disclose a liquid crystal display element having a reflection substrate fails to disclose the recited features of claims 1 and 16 also fails to disclose that an optical axis of an incident light beam upon the liquid crystal layer and an optical axis of an emergent light beam from the liquid crystal layer are present in a plane which is substantially perpendicular to a direction of orientation of liquid crystal molecules on the two substrates and that the incident light beam impinges upon the liquid crystal layer in a direction which is inclined by predetermined angle to the direction of the normal line of the substrate, recognizing that as shown in Fig. 4 of Dir et al, the optical axis 10 from the light source 11 is coincident with a line normal to the substrate.

Furthermore, irrespective of the contentions by the Examiner, Dir et al also fails to disclose or teach a direction of polarization of the incident light beam upon the liquid crystal layer is substantially perpendicular or parallel to the direction of orientation of the liquid crystal molecules, and therefore, applicants submit that Dir et al fails to overcome the deficiencies of Kubo et al as pointed out above, and the combination, as suggested by the Examiner, cannot be properly combined in the sense of 35 U.S.C. 103 with the resultant combination failing to provide the claimed features as

set forth in independent claims 1 and 16 and the dependent claims of this application. Thus, applicants submit that claims 1 and 16, as amended, patentably distinguish over this proposed combination in the sense of 35 U.S.C. 103 and should be considered allowable thereover.

With regard to the addition of Melnick et al to Kubo et al and Dir et al, applicants note that by the present amendment, the features of claims 2 and 17 have been incorporated into parent independent claims 1 and 16, respectively, and that irrespective of whether or not Melnick et al may be considered to disclose or teach that by choosing the orientation direction of the LC molecules on the side of a polarizing means to be substantially parallel to the direction of polarization of the incident light or by choosing this orientation direction to be perpendicular to the polarization direction, as contended by the Examiner, Melnick et al does not overcome the deficiencies of Kubo et al and Dir et al as described above, and cannot be properly combined with the other cited art in the sense of 35 U.S.C. 103. Hereagain, applicants submit that the Examiner has engaged in a hindsight reconstruction attempt which does not provide the claimed features as set forth in the independent and dependent claims of this application. Thus, applicants submit that all claims patentably distinguish over this proposed combination of references in the sense of 35 U.S.C. 103.

Likewise, with respect to the other references utilized in the various combinations as set forth by the Examiner, applicants submit that the addition of Okada, Nozomi, Ichikawa et al, Tanaka, and Mlyake et al, irrespective of the individual teachings of the such references, such references cannot be properly combined with the other cited art to overcome the deficiencies of Kubo et al and Dir et al as pointed out above, such that the proposed combination again represents different hindsight reconstruction attempts utilizing the principle of "obvious to try" which is not the standard of 35 U.S.C. 103. For example, claim 11 recites the

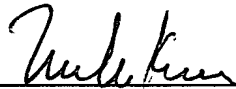
feature that the liquid crystal layer is driven by an electric field component which is mainly parallel to the substrate, which is not disclosed by Kubo et al, Dir et al or Melnick et al. Thus, applicants submit that all claims patentably distinguish over all of the cited art taken alone or in any combination thereof in the sense of 35 U.S.C. 103, such that all claims should be considered to be allowable thereover.

In view of the above amendments and remarks, applicants submit that all claims present in this application should now be in condition for allowance, and issuance of an action of a favorable nature is courteously solicited.

Applicants also submit herewith an Information Disclosure Statement and consideration of the documents are respectfully requested.

To the extent necessary, applicant's petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (500.41256X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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